

## CLAIMS

1. A ring-opened polymer hydrogenated product containing a repeating unit originating from a polycyclic norbornene monomer with three or more rings in the polymer repeating units, having a weight average molecular weight of 500 to 1,000,000, and having a racemo diad proportion of 51% or more.

2. The ring-opened polymer hydrogenated product according to claim 1, wherein the racemo diad proportion is 70% or more.

3. The ring-opened polymer hydrogenated product according to claim 1, wherein the content of the repeating unit originating from a polycyclic norbornene monomer with three or more rings is 50 mol% or more.

4. The ring-opened polymer hydrogenated product according to claim 1, wherein the repeating unit originating from a polycyclic norbornene monomer with three or more rings is a repeating unit originating from dicyclopentadiene.

5. The ring-opened polymer hydrogenated product according to claim 1, which is a crystalline polymer.

6. The ring-opened polymer hydrogenated product according to claim 5, which is a polymer having a melting point of 150°C or more.

7. A process for producing the ring-opened polymer hydrogenated product according to claim 1, comprising a step of polymerizing a polycyclic norbornene monomer having three or more rings by solution polymerization using a group 6

transition metal compound with a hydroxyl group-containing aryloxy group or a hydroxyl group-containing alkoxyl group bonded thereto as a polymerization catalyst to obtain a ring-opened polymer and a step of hydrogenating double bonds in the main chain of the ring-opened polymer.

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8. The process according to claim 7, wherein the group 6 transition metal compound with a hydroxyl group-containing aryloxy group or a hydroxyl group-containing alkoxyl group bonded thereto is a compound shown by the following formula (a),

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wherein M is a transition metal of group 6 of the periodic table,  $R^a$  is a substituted or unsubstituted phenyl group with a substituent at any of 3, 4, or 5 position or a group represented by  $-CH_2R^d$ , wherein  $R^d$  indicates a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, X represents a halogen atom, alkyl group, aryl group, or alkylsilyl group, Y is a hydroxyl group-containing aryloxy group or a hydroxyl group-containing alkoxyl group, L is an electron donating neutral ligand, and b is an integer of 0 to 2.

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9. A process for producing the ring-opened polymer hydrogenated product according to claim 1, comprising a step of polymerizing a polycyclic norbornene monomer having three or more rings by solution polymerization using a group 6 transition metal compound shown by the following formula (b) as a polymerization catalyst to obtain a ring-opened polymer and a step of hydrogenating double bonds in the main chain of the ring-opened polymer,

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wherein M is a transition metal of group 6 of the periodic table, R<sup>b</sup> is a substituted or unsubstituted phenyl group with a substituent at any of 3, 4, or 5 position or a group  
 5 represented by –CH<sub>2</sub>R<sup>d</sup>, wherein R<sup>d</sup> indicates a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, X represents a halogen atom, alkyl group, aryl group, or alkylsilyl group, R<sup>c</sup> is a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group, L is an electron donating neutral ligand, a is 0 or 1, and b is an integer of 0 to 2.

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